

Team Member Names: _____
Chem 227/ Dr. Rusay

Integrated Spectroscopy and Reaction Chemistry: Analysis of a Draft for Publication
Team Check List/ Conclusions/ Questions

Check List:

	Confirms Reaction/ Products & Structure	Refutes Reaction/ Products & Structure
MS		
IR/ UV		
¹ H NMR		
¹³ C NMR		
[α]		

Conclusions:

- 1) Write the chemical reaction below that you believe has occurred based on the check listed data and the conclusions of the expert groups. Your team should be in consensus. If the reaction in the draft is correct simply recopy it.
 - 2) Is the yield correct based on your reaction and balanced equation in question #1? If not, recalculate it. In either event, show a calculation to support your answer.
 - 3) Explain how the optical rotation supports your conclusion for the product.
 - 4) If the product's odor, boiling point and index of refraction were researched in the literature and compared to the product's actual values would these provide a definitive proof of structure if they were fairly close in agreement? Briefly explain your answer.
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Questions:

- 1) In the draft's procedure, sodium bicarbonate is used to remove unwanted by-product from the crude product before distillation. Write a balanced net ionic equation for the reaction that occurs in the bicarbonate washing.

- 2) Would using sodium hydroxide instead of sodium bicarbonate improve the yield, decrease it, or have no effect? Briefly explain the reason your choice.

- 3) If *l*-carvone were used instead of the *d*- isomer as the starting material, would there be a different product formed? Briefly explain how the observed optical rotation of the product supports your answer.

- 4) Does any of the spectroscopic data support more than one possible structure? If so, identify which spectroscopic method is ambiguous and explain why.

- 5) List any reducing reagents, which you have been introduced to in Chem 226/ 227, that would produce the products shown in the draft.

Bonus question:

Provide a step by step mechanism for the formation of the product from your answer to question #1 using the reagents in the draft's procedure.